Chukotka Autonomous Region Power and Renewable Energy

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For Energy Issues
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Air Distance between Anadyr and Selected Destinations

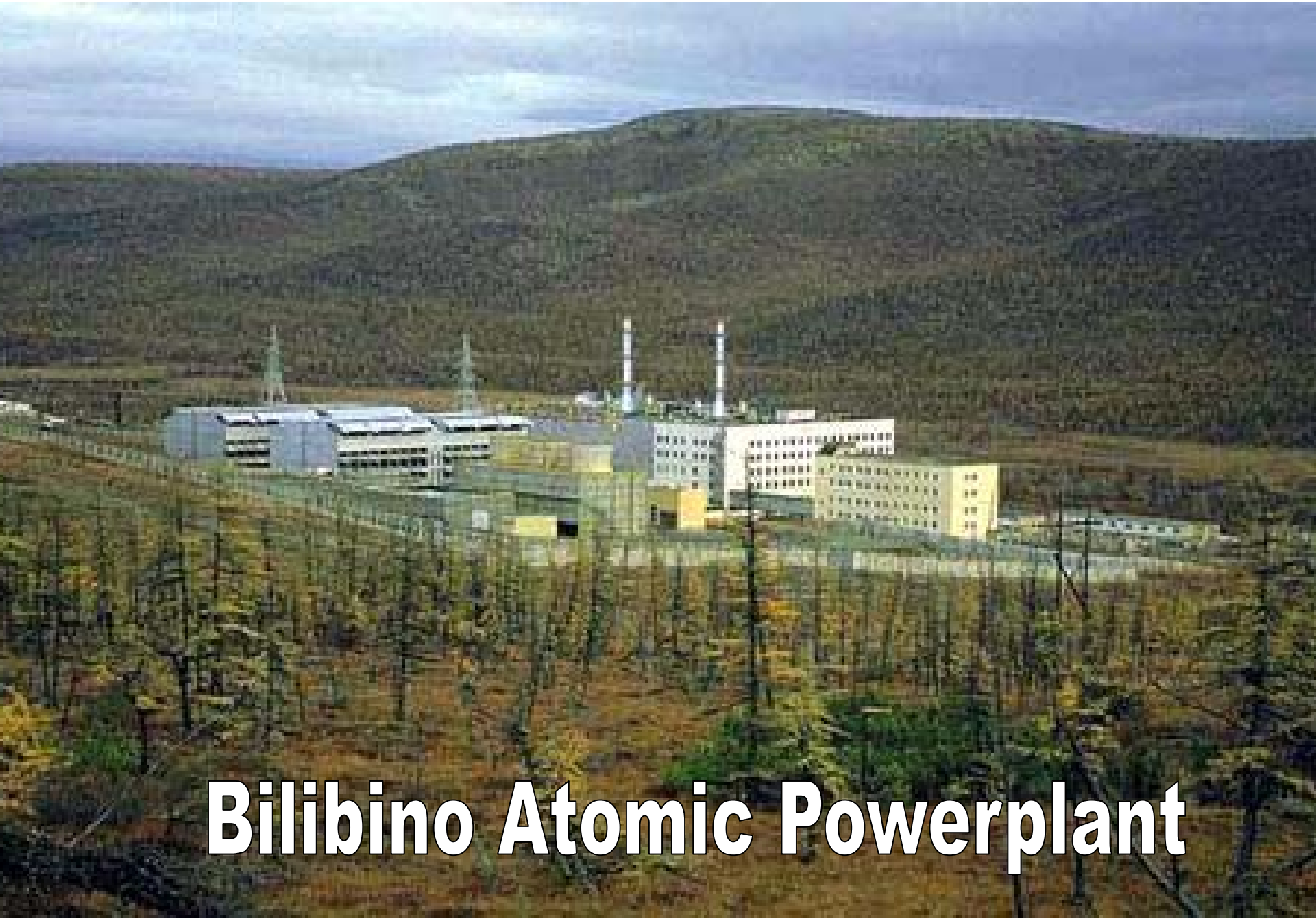
Chukotka is the Russian region closest to the United States and Alaska. Since 1992, one of 89 equal subjects of the Russian Federation

The Chukotka Autonomous Region

- **Located in extreme Northeast of Russia**
- **Area is 737,700 square kilometers, twice the size of Japan, or France and the UK combined**
- **Population 56,000, of which, 17,000 Native people**
- **More than half of area located north of the Arctic Circle**
- **Extreme climactic conditions, with permafrost**

Chukotka Autonomous Region

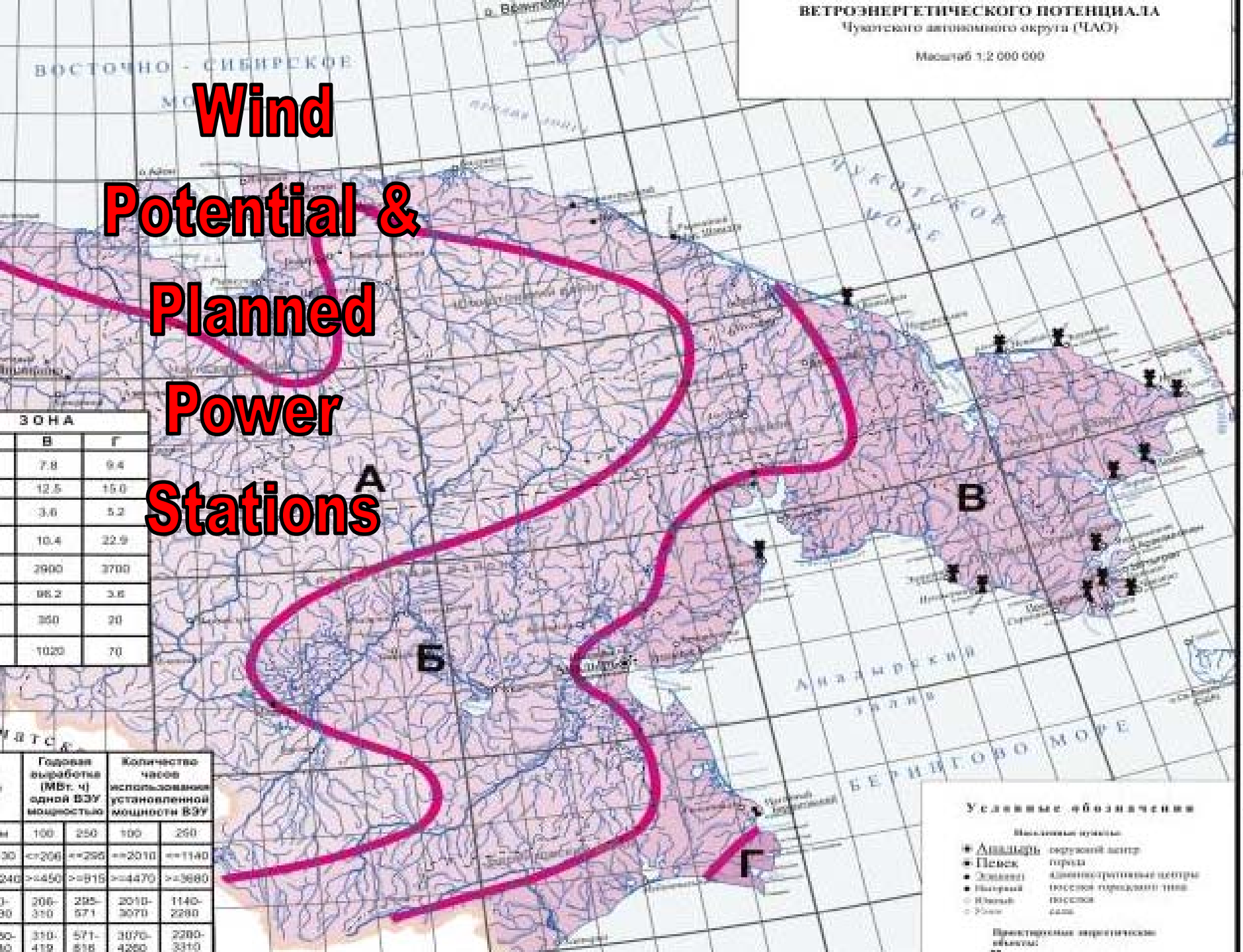
Governor of the Chukotka Roman Abramovich


Bilibino Atomic Powerplant

Anadyr Coal-fired Powerplant


Construction
of the new gas-fired
Anadyr Powerplant


Anadyr gas-fired Boiler
during construction

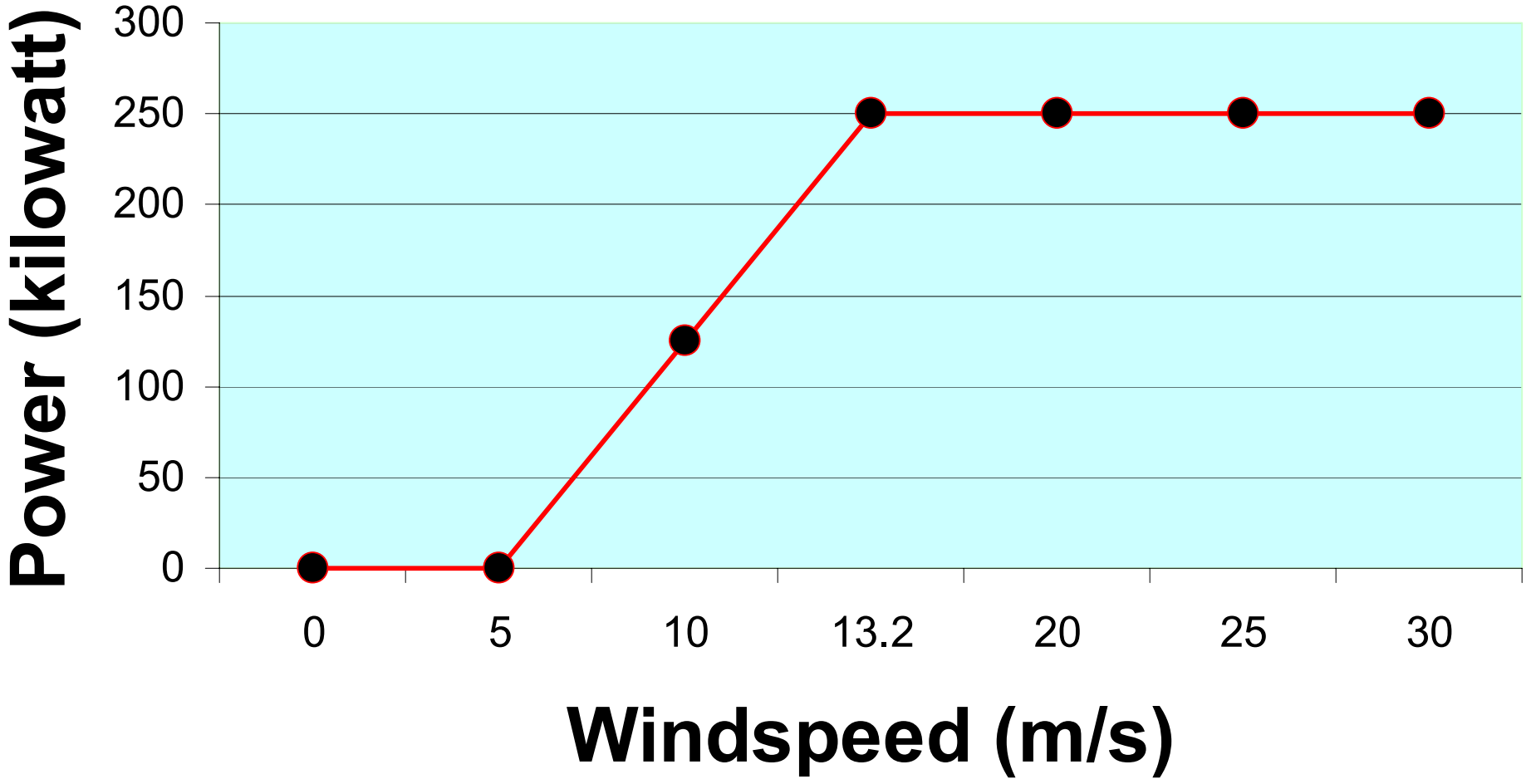

ВЕТРОЭНЕРГЕТИЧЕСКОГО ПОТЕНЦИАЛА
Чукотского автономного округа (ЧАО)
Масштаб 1:2 000 000
Wind
Potential &
Planned
Power
Stations
А
Б
В
Г
ЗОНА
В
Г
7.8
9.4
12.5
15.0
3.6
5.2
10.4
22.9
2900
3700
98.2
3.8
350
20
1020
70
Годовая выработка (МВт. ч) одной ВЭУ мощностью
Количество часов использования установленной мощности ВЭУ
100
250
100
250
<=206
<=295
<=2010
<=1140
>=450
>=915
>=4470
>=3680
206-310
295-571
2010-3070
1140-2280
310-419
571-816
3070-4260
2280-3310
Условные обозначения
Населенные пункты
Анадырь
окружной центр
Певек
города
поселки
Пристрастные энергетические объекты
Берингово море

Power line under Anadyr Bay ties Anadyr City to International Airport

Wind-power Generator AVE-250SM

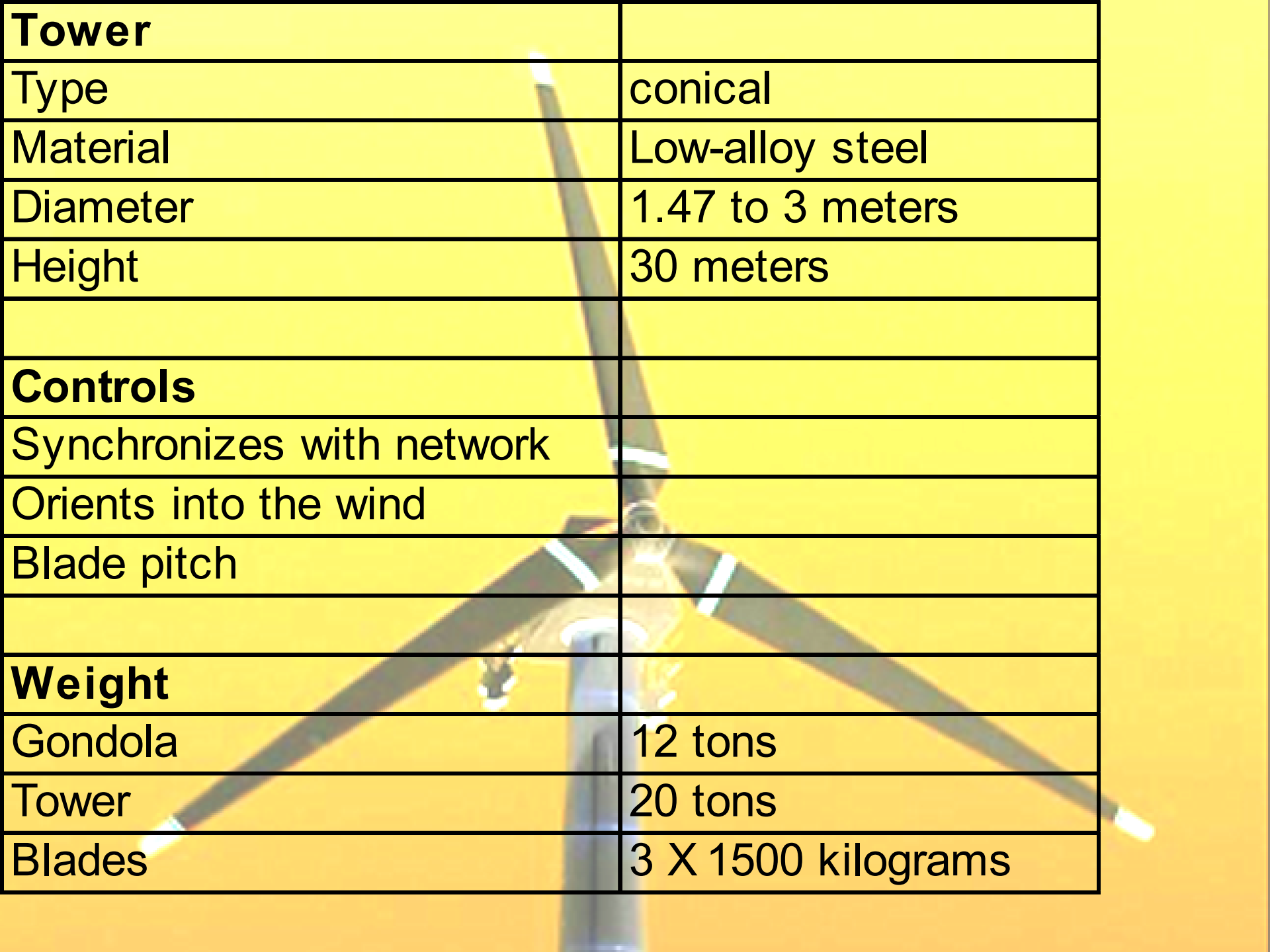
Operating Data	
Start up wind speed	5 meters/second
Maximum working speed	30 meters/second
Rated wind speed	13.2 meters/second
Maximum non-working speed	60 meters/second
Life expectancy	25 years
Generator	
Type	synchronous
Rated power	250 kilowatt
Rotor speed	1500 rotations/minute
Voltage	380 volt
Frequency	50 hertz

POWER versus WINDSPEED



Wind-power Generator AVE-250SM

Rotor	
Number of blades	3 blades
Rotor diameter	25 meters
Cone angle	5 degrees
Direction	into the wind
Direction of blades (variable)	0 to 90 degrees
Rotor speed	47.9 rotations/minute
Blades	
Profile	NASA-44
length	12.5 meters
Material	Fiberglass



Tower	
Type	conical
Material	Low-alloy steel
Diameter	1.47 to 3 meters
Height	30 meters
Controls	
Synchronizes with network	
Orients into the wind	
Blade pitch	
Weight	
Gondola	12 tons
Tower	20 tons
Blades	3 X 1500 kilograms

Construction of the foundation of a Windpower generator


Construction of the
First section
of the first
wind generator

Assembly of the wind generator's blades

Placing the generator

Construction Crew of the First Chukotka Wind-power Station

The First Wind-power Generator in Chukotka

The wind generators at Cape Observation.

Spring 2002

Cape Observation – seven wind power generators. June 2002

First wind power station in Chukotka

World's first full-scale autonomous renewable energy system based on wind power and hydrogen. Utsira is the smallest municipality in Norway.